

**Notice of Allowability**

Application No.

10/761,127

Examiner

Dang T. Nguyen

Applicant(s)

SCHNABEL ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10 April 2006.
2. ☒ The allowed claim(s) is/are 4 - 17, 19 - 21, 23 and 24.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other Search history.

 4/24/06 RICHARD ELMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 280



***Response to Amendment***

1. This office action is in response to applicant's amendment received on 4/10/06. Claims 4, 6, 11, 14, 19, 20 and 21 have been amended. Claims 1 – 3, 18 and 22 have been canceled. Claims 23 and 24 have been added. Claims 4 – 17, 19 – 21, 23 and 24 are pending on this application. Claims 1, 4, 11, 19 and 21 are independent claims.

***EXAMINER'S AMENDMENT***

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Gero McClellan on June 16, 2006.

The application has been amended as follows:

Amendment (for claim 21) A circuit for adjusting a frequency of a refresh signal used to refresh dynamic memory cells, comprising:

a first set of reference cells connectable to a first common bit line by activation of a first common word line;

an oscillator configured to output a clock signal at a fundamental frequency;

a regulating circuit configured to:

monitor an amount of charge loss of the first reference cells; and  
set a divider value on the basis of the amount of charge loss,

wherein regulating circuit is configured to:

increase the divider value if the monitored amount of charge  
loss falls below a first threshold value; and

decrease the divider value if the monitored amount of charge  
loss exceeds a second threshold value;

a frequency divider circuit configured to divide the clock signal at the fundamental frequency by the divider value, thereby producing the refresh signal at an adjusted frequency; and



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a counter configured to store the divider value.

Cancel claim 22.

Claim 23, line 1 change "22" To - - 21- -

***Allowable Subject Matter***

3. Claims 4 – 17, 19 – 21, 23 and 24 are allowed.

4. The following is an examiner's statement of reasons for allowance:

**With respect to claim 4**, the prior art of record fails to anticipate or make obvious a method for refreshing dynamic memory cells arranged along word lines and bit lines, in combination with other limitations, comprising: "increasing the frequency divider value if the monitored amount of charge loss falls below a first threshold value and decreasing the frequency divider value if the monitored amount of charge loss exceeds a second threshold value".

**With respect to claim 11**, the prior art of record fails to anticipate or make obvious a circuit for adjusting a frequency of a refresh signal used to refresh dynamic memory cells, in combination with other limitations, comprising: "a regulating unit comprising a frequency divider circuit and a counter for storing a frequency divider value for controlling the frequency divider circuit".

**With respect to claim 19**, the prior art of record fails to anticipate or make obvious a memory device, in combination with other limitations, comprising: "the frequency of the refresh signal is established by dividing the fundamental frequency of an oscillator circuit by a counter value, the counter value being the frequency divider



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value; and the refresh frequency adjust circuit is configured to adjust the frequency of the refresh signal by adjusting the counter value”.

**With respect to claim 21**, the prior art of record fails to anticipate or make obvious a circuit for adjusting a frequency of a refresh signal used to refresh dynamic memory cells, in combination with other limitations, comprising: “regulating circuit is configured to: increase the divider value if the monitored amount of charge loss falls below a first threshold value; and decrease the divider value if the monitored amount of charge loss exceeds a second threshold value; a frequency divider circuit configured to divide the clock signal at the fundamental frequency by the divider value, thereby producing the refresh signal at an adjusted frequency; and a counter configured to store the divider value”.

Dependent claims 5-10, 12-17, 20, 23 and 24 are allowed based on the allowance of the respective independent claims 4, 11, 19 and 21 above.

5. The prior art made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Mullarkey and Janzen taken individually or in combination, do not teach the claimed invention of increasing or decreasing the frequency divider value if the monitored amount of charge loss falls below or exceeds a threshold value, in combination with other limitations.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”



***Contact Information***

7. Any inquiry concerning this communication from the examiner should be directed to Dang Nguyen, who can be reached by telephone at (571) 272-1955. Normal contact times are M-F, 8:00 AM - 4:30 PM.

Upon an unsuccessful attempt to contact the examiner, the examiner's supervisor, Richard Elms, may be reached at (571) 272-1869.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is (703) 305-3900. The faxed phone number for organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the Status of an application may be obtained from the patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or [EBC@uspto.gov](mailto:EBC@uspto.gov).

Dang Nguyen 6/16/2006